Spring 4-2018

A Strategic Audit of Tesla, Inc.: Electrifying our Future or About to Run out of Energy?

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An Undergraduate Honors Thesis
Submitted in Partial Fulfillment of
University Honors Program Requirements
University of Nebraska-Lincoln

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April 24, 2018

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Abstract

Tesla, Inc.'s stock had reached its peak during September of 2017. However, due to manufacturing delays of its new Model 3 sport sedan, cash flow issues, and a recent fatal autopilot accident, investors and consumers are questioning the firm's long-term stability. Although Tesla has created technology that makes it easier for consumers to harness and utilize electricity to power their homes and vehicles, many wonder if the company's stock price is about to figuratively run out of energy. The following will be a strategic analysis, illustrating the firm's Current Strategy & Background Information, Situational Analysis & Issue Summary, Strategy Recommendations & Why, Implementation Plan, and Contingency Plan. Primarily using research collected from Tesla's 2017 Annual Report, informational materials published by the firm, and a few third-party analyses, conclusions can be drawn as to the threats, opportunities, and competitive advantages of the company. The threats of government regulation, legal battles, cash-flow shortages, slow customer adaptation, and manufacturing delays, place pressure on Tesla's business model. However, the sustainable energy market is the way of the future, giving Tesla opportunities to expand to new regions, trucking and public transport product markets, and an autonomous driving "shared fleet." Tesla's autonomous driving technology, over-the-air software updates, Supercharger network, battery life, and complete vertical integration set it apart from its competitors. Finally, strategy

recommendations have been developed to mitigate major risk factors that could lead to bankruptcy.

Key Words:
- Strategic Audit of Tesla, Inc.
- Management
- Electric Vehicles
- Energy Generation and Storage
- Sustainable ecosystem

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Current Strategy & Background Information

Brief History: In 2003, a collection of engineers founded Tesla with the visions of providing all electric vehicles to consumers that are "better, quicker and more fun to drive than gasoline cars" and moving towards a future that is independent of fossil fuels (Tesla, 2018). The company unveiled its first all-electric car, the Roadster, in 2008 and has since built a product line of all-electric vehicles in addition to energy generation and storage devices (Tesla, 2018).

Initial Strategy: In a 2006 letter Elon Musk, Tesla's Co-Founder and CEO, explained that Tesla, Inc.'s overarching plan was to build a comprehensive range of electric vehicles, including family friendly cars at reasonable prices. However, the company realized that the introduction of new technology initially lacked economies of scale. Therefore, Tesla's strategy was to "enter at the high end of the market, where customers are prepared to pay a premium, and then drive down the market as fast as possible to higher unit volume and lower prices with each successive model" (Musk, 2006).

Current Strategy: Ten years later, after achieving Tesla's initial strategy goals, Elon Musk wrote a continuation of his "Master Plan." In order to bring about sustainability sooner, Tesla's current strategy is to focus on achieving four key objectives: 1) installing energy generation solar roofs and storage products in homes to work in conjunction with their electric cars; 2) tapping into new markets such as electric semis and public transport buses; 3) improving their autonomous driving software to make all vehicles fully-autonomous; 4) developing a "Tesla shared fleet" and app so customers' cars can make money for their owners while they are not in use (Musk, 2016).

Mission and Goals: Tesla's mission is to "accelerate the world's transition to sustainable energy" (Tesla, 2018). With the goal of making its products more affordable and attainable for consumers, the company hopes to bring about change and fast-track the clean transport/clean energy production movement. The firm wants to harness and combine the full power of its batteries, renewable energy generation and storage devices, and electric cars to create an "entire sustainable energy ecosystem" (Tesla, 2018).

Products: (Tesla, Inc. Annual Report)

- Vehicles

    - **Model S:** Fully electric four-door sedan priced at around $68,000. Seats 5.
    - **Model X:** Fully electric sport utility vehicle priced at about $82,500. Seats 7.
    - **Model 3:** Fully electric sport sedan which costs around $35,000. Seats 5.
- Energy Storage
    - **Powerwall 2**: Home/ small commercial facility energy storage 14 kWh rechargeable lithium-ion battery. Provides backup power in a grid outage or can be used to store generated solar power.
    - **Powerpack 2 System:** 210 kWh (AC) battery packs and 50 kVa inverters. Utilized in commercial and industrial facilities.
- Solar Energy Systems
    - **Solar panels:** Convert sunlight into electrical current
    - **Inverters:** Convert electrical output into a compatible current with the electrical grid
    - **Hardware:** Roof racking materials, monitoring devices, and electrical equipment that connects the solar energy system to the electrical grid
    - **Solar Roof:** Glass roof tiles that serve as solar panels, converting sunlight into electricity

Markets: (Tesla, Inc. Annual Report)

- Automotive: Tesla's vehicle sales compete with manufacturers of other alternative fuel/electric, internal combustion, and hybrid vehicles in the automotive market.

- Energy storage: Tesla competes with companies selling energy storage systems as well as individual components. The company has identified AES Energy Storage, Siemens, LG Chem, and Samsung as key competitors in this market.

- Solar Energy Generation Systems: In this market, Tesla competes with conventional utility companies that supply energy via fossil fuels. In addition, Tesla has identified its solar energy generation competition as Vivint Solar, Inc.; Sunrun Inc.; Trinity Solar; SunPower Corporation; and other smaller solar companies.

Situational Analysis & Issue Summary

Value Creation: Tesla's business model has a variety of components that create value for its customers. It is the only "vertically integrated sustainable energy company" in the world, offering products for generation, storage, and consumption (Tesla, 2017). According to its annual report, the company has a

strong brand recognition and offers innovative technology features such as autopilot, over-the-air software updates, and enhanced safety features. Tesla also offers its consumers long range battery life that exceeds competitors' and a network of Superchargers for expedited recharging. The firm's vehicles have the speed and power to outmatch many electric, gas powered, and hybrid competitors. Consumers can also take advantage of the energy efficiency and reduced cost of ownership of Tesla products (Tesla, 2017). For example, there are federal tax credits for energy efficiency, reduced costs to charge electric vehicles compared to fueling gas engines, and lower maintenance costs than combustion engines (Tesla, 2017).

Revenue Streams: (2017 Annual Report)

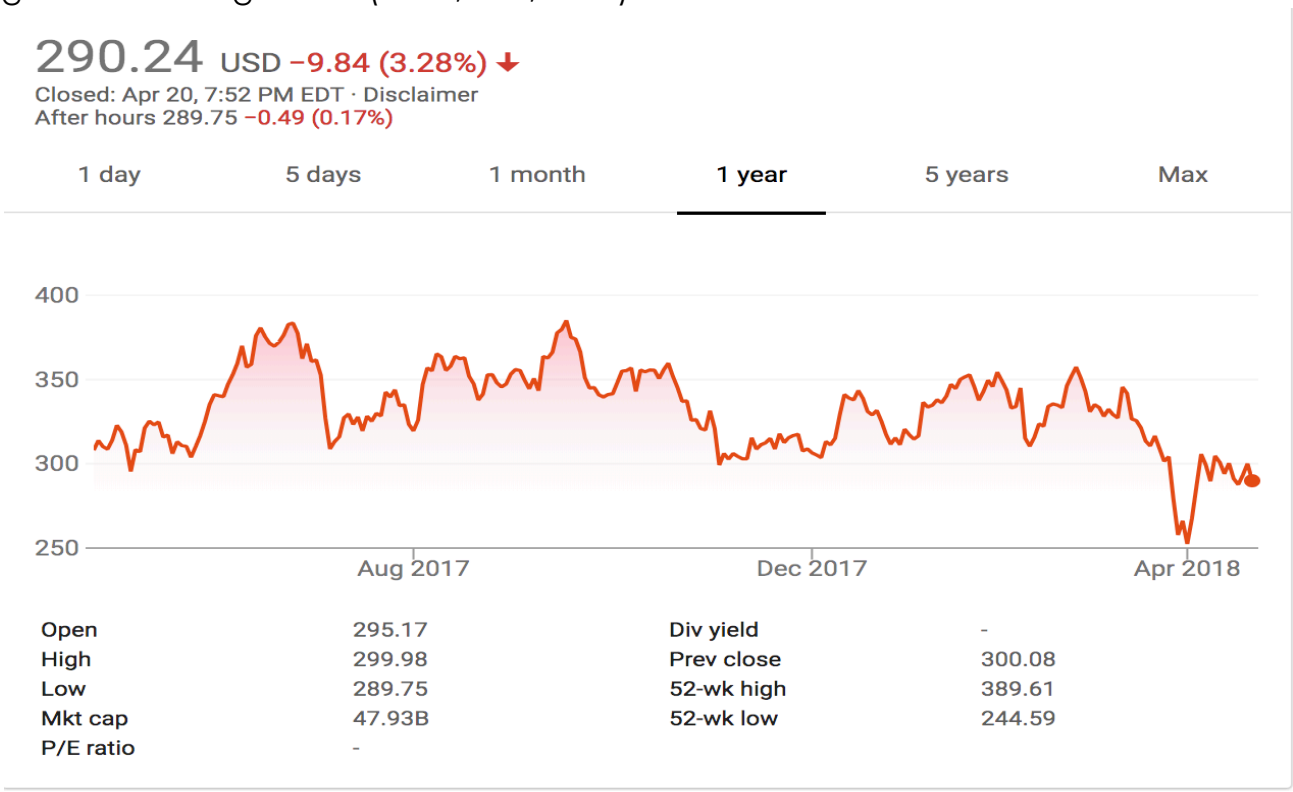
Automotive	• Sales: $8.53 Billion • Leasing: $1.11 Billion
Energy Generation and Storage	• $1.12 Billion
Services and Other	• $1 Billion

Cost of Revenues: (2017 Annual Report)

Automotive	• Sales: $6.72 Billion • Leasing: $708 Million
Energy Generation and Storage	• $875 Million
Services and Other	• $1.23 Billion

Issue Summary: In September of 2017, Tesla's stock price reached an all-time high of $389.61 per share (Nasdaq, 2018). However, due to Model 3 manufacturing delays and a fatal autopilot crash, the share value has recently been on a downward trend as seen in the chart below (Nasdaq, 2018). The key issues affecting the future success of Tesla, Inc., primarily involve its automotive products. According to Tesla's 2017 Annual Report, the company has identified

risk factors in manufacturing, cash flow, customer adaptation, legal, and government regulation (Tesla, Inc., 2017).



External Analysis: To begin the external analysis, a PEST strategy will be applied to the identified threat categories. A diagram of a Porter's Five Forces analysis and list of Tesla's potential opportunities will follow. All information for these assessments is obtained from Tesla's 2017 10-K report.

PEST:

Political / Legal:

Government Regulation

- Local and international regulations, political climates, labor laws, and tax reforms could affect growth.
- Potential removal of clean energy economic incentives could affect sales and increase company costs.
- Tesla is subject to manufacturing environmental and safety laws and regulations that impose costs.
- There is potential for government regulation of autonomous driving technology which is a key aspect of Tesla technology.

Legal

- Possible warranty claims
- Potential liability claims

- Possible intellectual property infringement claims
- Potential product recalls
- Potential for lithium ion battery cells to catch fire

Economic: Cash Flow

- Potential difficulty achieving target manufacturing costs
- Poor manufacturing performance and operating at a loss causing investor, analyst, and consumer caution
- Need significant cash to invest in expanding Tesla delivery centers, service centers, stores, Gigafactories, Supercharger stations, and ramping up manufacturing productions
- $10.17 billion in aggregate principal debt as of December 31, 2017
- Company is subject to fluctuating monetary exchange rates

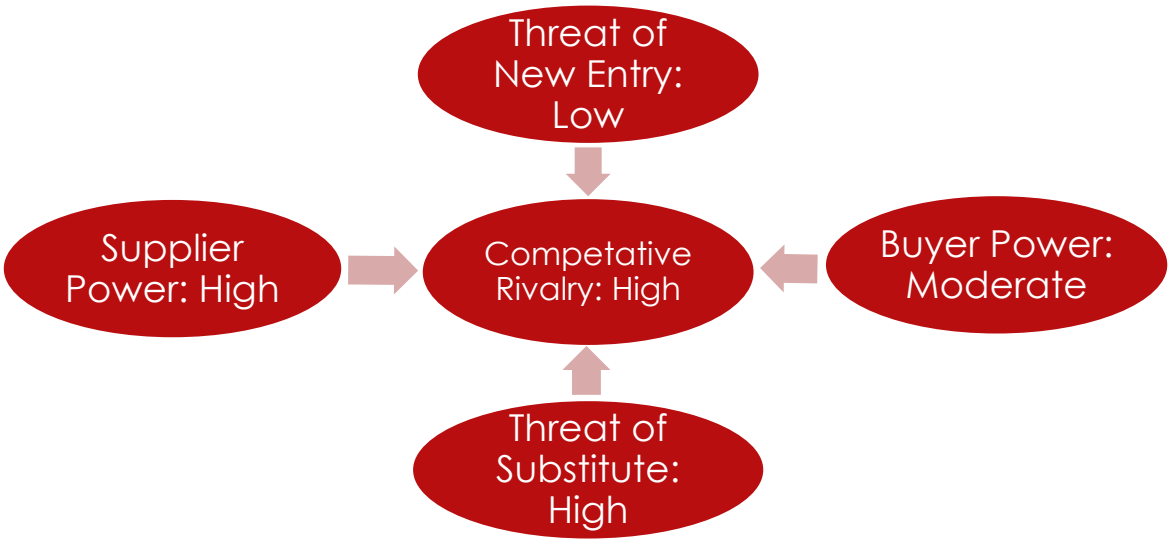
Social: Customer Adaptation

- Relies on quick mass market adaptation of electric vehicles for Tesla's future growth
- Aspects that are affecting customer perceptions of Tesla vehicles: features, safety, driving performance, defects, cost, battery range, economic incentives, access to charging facilities, the price of gas, other electric cars on the market

Technological: Manufacturing

- Delays in production ramp of new and existing products
- Unrealized production timelines caused by factory technology issues
- The need to hire and retain technologically experienced employees to expand Tesla's car factory and its battery Gigafactory 1
- Dependency on single-source suppliers for delivery of components

Porter's Five Forces:



Opportunities for Tesla: (Pratap, 2018)

- Expansion of sales to Asian countries
- Development of fully autonomous driving capabilities and resulting "shared fleet"
- Product expansion into new markets, such as public transport and trucking
- Sustainable technology is the future of the world

Internal Analysis: The internal analysis will be primarily comprised of core competencies, distinctive competencies, and competitive advantage. There will also be an examination of the Leader/Situation Fit.

Core Competencies: (2017 Annual Report)

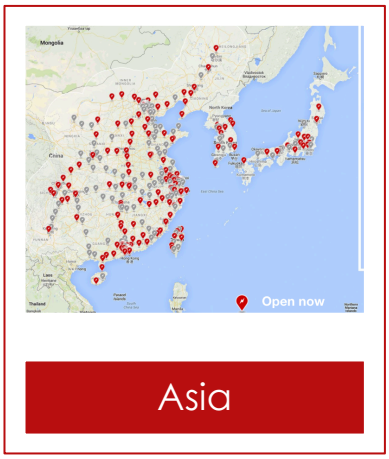
- Powertrain engineering
- Vehicle engineering
- Innovative manufacturing
- Energy storage
- Computer aided design
- Crash test simulation

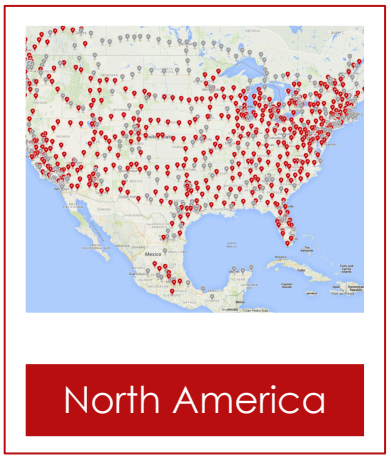
Distinctive Competencies: (2017 Annual Report)

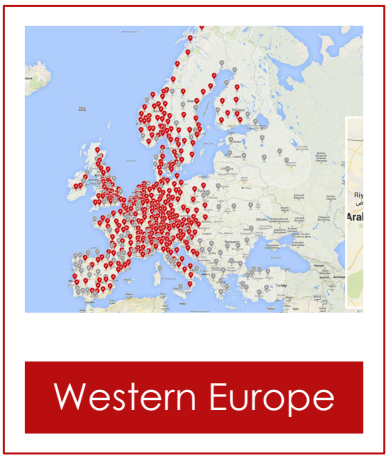
- Self-driving capabilities
- Battery life longevity in travel
- Vehicle Control and Infotainment Software
- Dual Motor Powertrain – allows for instantaneous motor response, controlled performance, and traction control

Competitive Advantage: Tesla is years ahead of its competition in data collection, battery manufacturing, charging stations, and technological capital. While companies like Mercedes Benz, Chevy, BMW, and Nissan slowly move towards product lines of electric vehicles, Tesla is already working to expand their fully electric vehicle line to new sectors like semi-trucks and public transportation (Shahan, 2017). In addition, Tesla has diversified outside of the auto market into solar energy generation and battery storage devices, giving them alternatives. It is the only fully vertically integrated company in its industry. The greatest competitive advantage offered by Tesla is its constantly advancing technology. The company offers a highway autopilot function in vehicles and is constantly working toward the goal of fully automated driving capabilities (Tesla 2017). Fully autonomous driving software will give Tesla consumers the ability to share their cars while not in use to make money for them. Tesla's remote software updates allows improvements to consumers' cars without the need to ever visit a service center. Another key competitive advantage is Tesla's Supercharging network (Shahan, 2017). Unlike other electric automakers, Tesla has spent time and resources ensuring that its customers are able to find a nearby fast-paced charging station nearly everywhere across North America, Western Europe, and parts of the Middle East and Asia as seen in the maps below (Supercharger, 2018).

Tesla Charging Network







Leader / Situation Fit: According to its 2017 Annual Report, Tesla is highly dependent upon its CEO, Elon Musk. In addition to CEO, Chairman of the Board of Directors, and largest Tesla stockholder, Musk also serves as CEO and CTO of Space Exploration Technologies (SpaceX) (Tesla, 2017). Musk is a risk taker and visionary leader with an extensive knowledge in computer programming. These qualities make him well suited as the leader of a tech company like Tesla. With

its innovative technology and dream of creating a "sustainable energy ecosystem," Tesla needs a risk-taker/visionary at its helm (Tesla, 2017).

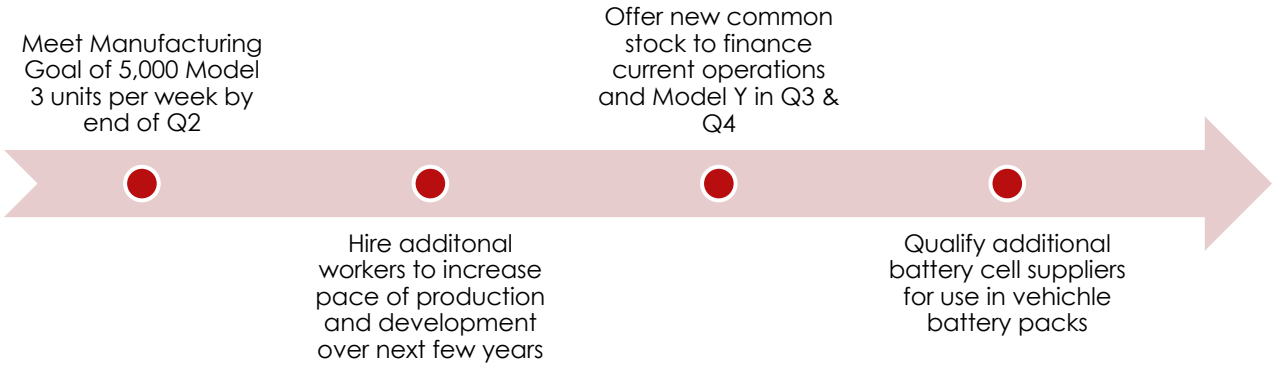
Strategy Recommendations & Why

Tesla has been operating at a loss for the past several years, culminating in a $1.96 billion net loss attributed to common stockholders for 2017 (Tesla, 2017). These losses are not uncommon in a fast-paced tech company and can primarily be attributed to a lack of economies of scale; need to establish delivery, charging, and service center infrastructure; and the cost of ramping up production. However, the billion dollar per quarter rate at which Tesla burns through cash, a fatal autopilot crash, and the 2017 model 3 manufacturing setbacks have put investors on edge (Ohnsman,2018). The main strategy recommendation that Tesla should focus on is improving its manufacturing efficiency. The company wants to expand into new foreign markets as well as add semis and public transport vehicles to its product lines (Tesla, 2017). But, these expansions will be ineffective in generating revenues if its current factory system cannot maintain production efficiency. In addition, Tesla should work to diversify its supply chain as many of its current suppliers are single-source, therefore creating a strong supplier power and potential for future delays. Finally, with its current high rate of cash spending, Tesla will need to either find ways to cut costs or expand its financing and investing activities (Tesla, 2017).

Implementation Plan

Recommendation Steps: Tesla productions have slowly gotten back on track in the first quarter of 2018 (Geuss, 2018). Meeting its previously stated manufacturing goal of 5,000 Model 3 units by the end of the second quarter will help put investors and consumers at ease, leading to new potential financing options (Tesla, 2017). In addition, Tesla will be able to sell more vehicles, raising much needed revenues. However, the company will need to hire more skilled workers over the next several years to keep up with planned production growth and introduction of the new electric semi (Tesla 2017). Tesla is in need of cash in order to continue its growth. The firm should begin raising funds by issuing new common stock or selling bonds and then use other forms of equity financing in the third and fourth quarters of 2018 when they plan to begin investment activities for the Model Y semi. One of the stated risks in Tesla's 2017 Annual Report was that it faced single-source supplier issues for vehicle components. In addition, the company currently has qualified only one battery cell supplier for its vehicle battery packs. Tesla will need to work to fully qualify additional suppliers of battery cells to safeguard against further production delays (Tesla, 2017).

Timeline:



Contingency Plan

If the previously stated recommendations do not work in preventing Tesla from running out of cash by the end of the year, there is a possibility of bankruptcy. However, in the event of bankruptcy, there is a potential for other companies with similar autonomous driving technologies like Google to acquire the company. Elon Musk could also attempt to merge Tesla and SpaceX or Uber to prevent bankruptcy (DeBord, 2018). Despite pessimistic forecasts for the company's chance of survival beyond 2018 with the current automotive manufacturing issues, Tesla is diversified in its product lines. In 2017 it generated $1.12 billion in revenues from energy generation and storage devices and another $1 billon in services and other components (Tesla, 2017). Going forward Tesla will need to learn about what led to this situation, plan for potential problems, sense the trigger point, and then react. If the company does not alter its current practices, it may not be able to further "accelerate the world's transition to sustainable energy" (Tesla, 2017).

References

DeBord, M. (2018, February 14). Tesla and SpaceX are already starting to merge - here's how. Retrieved April 23, 2018, from http://www.businessinsider.com/how-tesla-and-spacex-have-already-merged-2018-2?r=UK&IR=T

Geuss, M. (2018, April 03). Tesla pushes out 9,766 Model 3s in Q1 2018, sets ambitious Q2 goal. Retrieved April 23, 2018, from https://arstechnica.com/cars/2018/04/tesla-pushes-out-9766-model-3s-in-q1-2018-sets-ambitious-q2-goal/

Musk, E. (2006, August 2). The Secret Tesla Motors Master Plan (just between you and me). Retrieved April 17, 2018, from https://www.tesla.com/blog/secret-tesla-motors-master-plan-just-between-you-and-me

Musk, E. (2016, July 20). Master Plan, Part Deux. Retrieved April 17, 2018, from https://www.tesla.com/blog/master-plan-part-deux

Nasdaq. (2018, April 20). Historical Stock Prices. Retrieved April 21, 2018, from https://www.nasdaq.com/symbol/tsla/historical

Ohnsman, A. (2018, February 09). Tesla's $675 Million Loss Pulls Elon Musk Back To Earth After Stellar SpaceX Launch. Retrieved April 23, 2018, from https://www.forbes.com/sites/alanohnsman/2018/02/07/after-stellar-rocket-launch-teslas-675-million-loss-pulls-upbeat-musk-back-to-earth/#6af79a6261ba

Pratap, A. (2018, March 20). Tesla SWOT Analysis. Retrieved April 22, 2018, from https://www.cheshnotes.com/2017/10/tesla-swot-analysis/

Shahan, Z. (2017, December 14). Tesla's Competitive Advantages - 5 Big Ones. Retrieved April 23, 2018, from https://evobsession.com/tesla-competitive-advantage-5-big-ones/

Tesla. (2018). Supercharger | Tesla. Retrieved April 23, 2018, from https://www.tesla.com/supercharger

Tesla, Inc. (2017, December 31). 10-K Annual Report. Retrieved April 17, 2018, from http://ir.tesla.com/secfiling.cfm?filingid=1564590-18-2956&cik=1318605#TSLA-10K_20171231_HTM_ITEM_1A

Tesla, Inc. (2018). About Tesla. Retrieved April 17, 2018, from https://www.tesla.com/about